Critical Mineral Reliance

An Analysis of the United States' Dependence on Unreliable Countries

Introduction

- Of the 50 critical minerals, many are primarily imported from other countries
- In this presentation, we will investigate which countries we rely on for these minerals
- We will demonstrate that we heavily rely on minerals from non-ally countries, including many countries that are our adversaries

Source: https://www.state.gov/minerals-security-partnership/

Critical Minerals

- Each year, the Department of Energy defines 50 critical minerals, that (among other things) serve “an essential function in one or more energy technologies”
- For example, dysprosium is one such 2023 mineral as its applications include “data storage devices, laser applications, and permanent magnets” (USGS: Mineral Commodity Summaries 2023)
- It is precisely because these minerals are so important, that it is incumbent upon us to investigate where we get them from and whether these are reliable sources

Countries

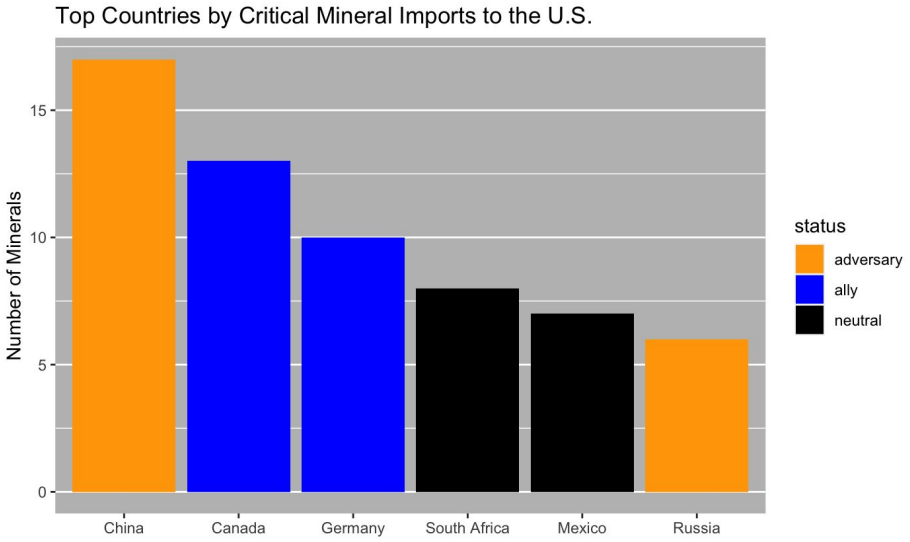
We consider three categories of countries

1. Allies: these include NATO members as well as countries defined as major non-NATO allies (MNNAs)

2. Adversaries: these include Russia, China, Iran, North Korea, Afghanistan, and Belarus

3. Neutral: these include countries that are neither allies nor adversaries
    a. Some of these countries are quite weak compared to world powers and could be manipulated by our powerful adversaries in times of economic crisis or war

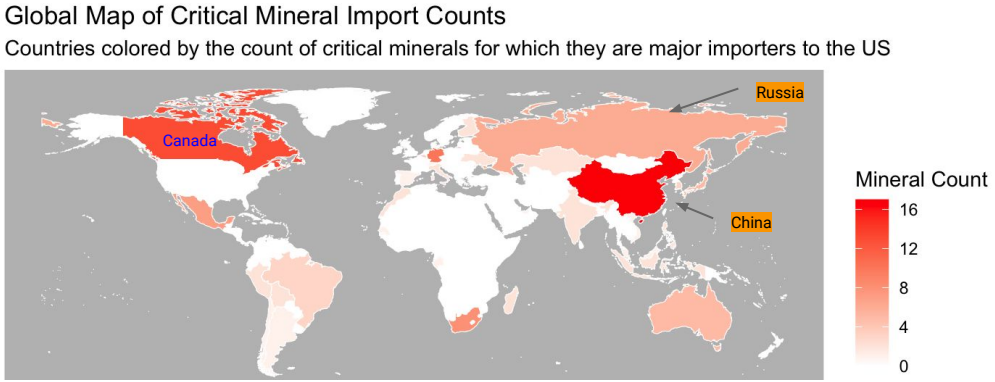
Top Importers of Critical Minerals



- First, we look at the top importers for each critical mineral (USGS: MCS2023_Fig2_Net_Import_Reliance) and look at how many times each country is a major supplier for a critical mineral

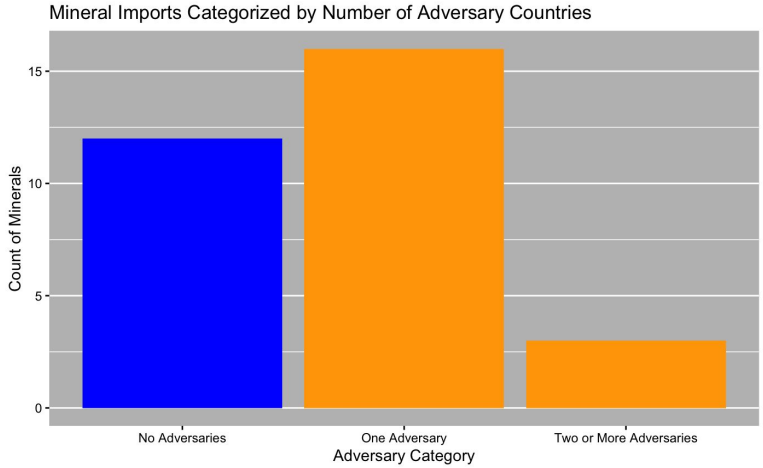
- Of the countries that are major suppliers for the most critical minerals, 2 are adversaries, 2 are allies and 2 are neutral

Top Importers of Critical Minerals (a broader view)



- Again, while there are a number of countries the US depends on for critical minerals, the presence of two adversary world powers is disconcerting

A Mineral-Centric Perspective



- The situation may be even worse than it seems; the US depends on adversary countries for *most* of the imported critical minerals
- Worse, for three minerals, the major importers include two or more adversaries, suggesting they could significantly shut down US supply

A Mineral-Centric Perspective (a deeper dive)

- In fact, there are only 5 critical minerals (cesium, cobalt , nickel, niobium, and rubidium) where all the major importers are allies
- But, as we just discussed, the major importers for 3 critical minerals (aluminum, germanium, and lithium include two or more adversaries
- A view of these critical minerals applications clarifies the risks associated with this overdependence

Critical Mineral	Primary Applications
Aluminum	Metallugical applications but also many sectors of the economy
Germanium	Defense and fiber optics applications
Lithium	Battery applications

Conclusion

- The U.S. important many critical minerals, and many minerals are imported from one or more adversary countries
- The reliance on adversary (and even neutral) countries presents national security risks especially given geopolitical tensions and the possibility of economic crisis.
- Given these trends, it is critical that policymakers consider domestic production, otherwise growing stockpiles, adding import sources, and strengthening alliances and trade agreements